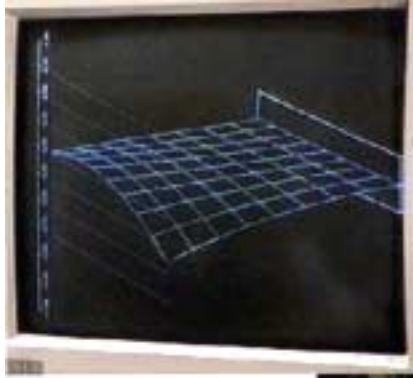


DISTRIBUTED FIBER OPTIC POINT STRAIN SENSORS



Steel plate with surface mounted sensor array

Computed surface (with vertical exaggeration) based on output of fiber optic sensors on plate



The Naval Research Laboratory has broad expertise in the field of structural sensing using fiber optic sensors. NRL patented technologies include a method for online fabrication of fiber Bragg gratings during the fiber drawing process; various techniques for demodulation of an optical signal from a fiber optic sensor; and several transduction mechanisms for converting fiber optic strain signals to other measurands, such as pressure, temperature and acceleration. Together, these technologies enable fiber optic sensors that are affordable, yet can out-perform existing devices.

Features and advantages include:

- Strain sensitivity up to $10^{-9} \Delta L/L$ (with ~1-cm gage length)
- Frequency bandwidth from DC to several kilohertz
- Broad dynamic range (114 dB)
- Can multiplex dozens of sensors on a single fiber
- Capable of remote sensing (up to several kilometers) via optical fiber
- Can be embedded or surface mounted

Applications include:

- Monitoring structural health of aircraft, bridges, dams, tunnels, mines, buildings, stadiums, pipelines, storage tanks, etc.
- Monitoring performance and condition of machinery and engineering systems
- Monitoring highway traffic parameters, e.g. volume, speed, and weight
- Security systems, e.g. perimeter sensing and intrusion detection

License are available to companies with commercial interest.

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